FCC CFR47 PART 22 SUBPART H
FCC CFR47 PART 24 SUBPART E

CLASS II PERMISSIVE CHANGE

FOR

CDMA2000 1X/1X-EVDO, WCDMA/HSPA AND GSM/GPRS/EDGE PCI EXPRESSTM MINI CARD (TESTED INSIDE OF NOTEBOOK PC, MODEL NP-N150)

MODEL NUMBER: GOBI2000

FCC ID: A3LGOBI2000

REPORT NUMBER: 09I12978-1, Revision C

ISSUE DATE: JANUARY 25, 2010

Prepared for

SAMSUNG ELECTRONICS CO., LTD.
416 MAETAN 3-DONG, YEONGTONG-GU
SUWON-CITY, GYEONGGI-DO, 443-742 SOUTH KOREA

Prepared by

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
---	12/28/09	Initial Issue	T. Chan
A	01/13/10	Added GPRS Worst Case Mode In Section 5.5	T. Chan
B	01/15/10	Update Antenna Gain For both Cell and PCS Bands	M. Mekuria
C	01/25/09	Revised EUT description on section 5.1	A. Zaffar

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
416 MAETAN 3-DONG, YEONGTONG-GU
SUWON-CITY, GYEONGGI-DO, 443-742 SOUTH KOREA

EUT DESCRIPTION: CDMA2000 1X/1X-EVDO, WCDMA/HSPA AND GSM/GPRS/EDGE PCI EXPRESSTM MINI CARD (TESTED INSIDE OF NOTEBOOK PC, MODEL NP-N150)

MODEL NUMBER: GOBI2000

SERIAL NUMBER: N/A

DATE TESTED: DECEMBER 28, 2009

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 22H and 24E	PASS

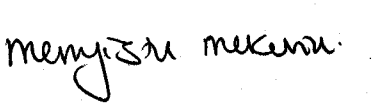
Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

THU CHAN
EMC MANAGER
COMPLIANCE CERTIFICATION SERVICES

Tested By:



MENIGISTU MEKURIA
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-C, FCC CFR 47 Part 2, FCC CFR 47 Part 22, FCC CFR Part 24, RSS-132 Issue 2, and RSS-133 Issue 5.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Cellular/PCS GSM/EDGE/WCDMA WITH 802.11 B/G/N 1X1 AR5B95 Mini PCI Transmitter Card that installed inside Samsung mini PC Notebook

5.2. MAXIMUM OUTPUT POWER

The test measurement passed within ± 0.5dBm of the original output power.

5.3. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The major change filed under this application is:

Change #1 Add a portable platform. Model: NP-N150

Change#2 Collocated with Bluetooth FCCID: QDS-BRCM1043, WLAN FCC ID: PPD-AR5B95

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes PIFA antennas, with a maximum gain of 2.3 and 3.7 dBi for Cell and PCS bands respectively.

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power.

Since this is class II permissive change selected to install the Gobi2000 module in portable host, so only the worst case of ERP/EIRP power and radiated spurious emission tests in two modes GPRS 850 / Class 10 and GPRS 1900 / Class 10.

5.6. SOFTWARE AND FIRMWARE

The EUT is linked with Agilent Communication Test Set.

PROCEDURE USED TO ESTABLISH TEST SIGNAL

GSM/GPRS

To reset the Agilent 8960 to default all values > Shift & Preset

To adjust Input/Output offset, press SYSTEM CONFIG button above the control knob

> RF IN/OUT Amptd Offset

> RF IN/OUT Amptd Offset Setup

> Enter frequencies to be tested and corresponding offsets (enter negative values for offset, i.e.-35 is greater than -30).

Control

Operating Mode > Active Cell (GSM) / Active Cell (GPRS)

Connection Type > Auto (For Voice Mode) / ETSI Type A (For Data Mode)

Call Parms

BCH Parameters > Cell Power > adjust to (~ -50dBm) to maintain strong link OTA

> Cell Band > PCS or GSM850 (US band)

TCH Parameters > Timeslot >1

> Traffic Channel > PCS Channel 512 / 661 / 810

> GSM850 Channel 128 / 190 / 251

> MS TX Level > 1 (for both PCS or GSM850)

> Timeslot > 1

> Speech Setup > Speech Source > Echo (Default)

Press “Originate Call”

GPRS ONLY

TCH Parameters > Traffic Channel > PCS Channel 512 / 661 / 810

> GSM850 Channel 128 / 190 / 251

> MS TX Level > 3 (33dBm for Cell band); 3 (30dBm for PCS band)

PDTCH > Multislot Config > 1 Down, 2 Up

> MS TX Level > 5 (33dBm Cell band); 1 (30dBm PCS band)

> Coding Scheme > CS-4

After the 8960 attaches to the EUT, then press “Start Data Connection”

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Samsung	NP-N150	ZN3N93LSA00027T	DoC
AC/DC	Delta Electronics Inc.	ADP-40MH AB	CNBA4400262ABZ0492J8055	DoC

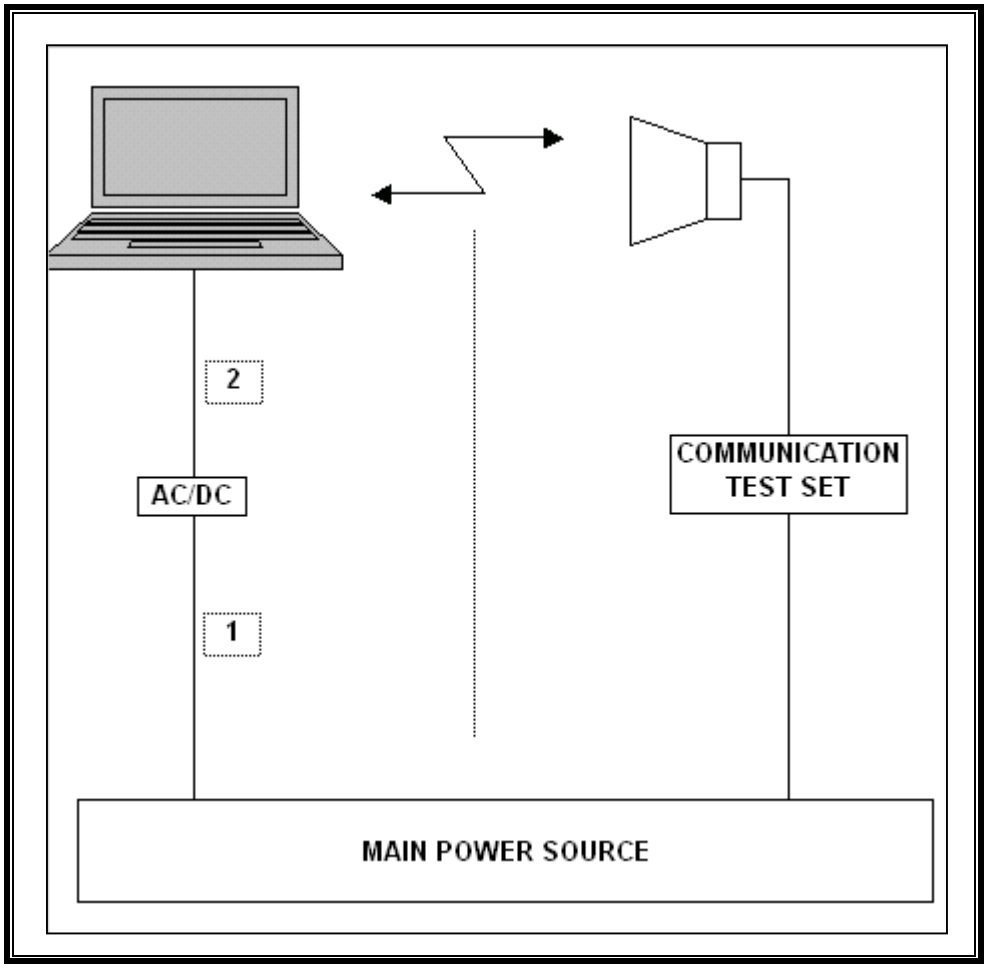
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC Input	1	AC	Un-Shielded	2.0 m	N/A
2	DC Output	1	DC	Un-Shielded	2.0 m	Ferrite at one End

TEST SETUP

The EUT is a PCI E Mini card that installed inside Samsung Notebook Laptop. Communications Test Set is used to link the device under test.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	02/04/10
Antenna, Horn, 18 GHz	EMCO	3115	C00783	01/29/10
Antenna, Horn, 18 GHz	EMCO	3115	C00943	01/29/10
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	01/14/10
Signal Generator	R & S	SMP04	C00953	02/16/11
Communications Test Set	Agilent / HP	E5515C	C01086	06/16/10
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	08/31/10
Dipole	Speag	D900V2	NA	11/16/11
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02689`	CNR
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02687	CNR

7. LIMITS AND RESULTS

7.1. MAXIMUM RADIATED OUTPUT POWER

The transmitter has a maximum ERP & EIRP Peak output powers as follows:

824 to 849 MHz Authorized Band

Frequency Range (MHz)	Modulation	ERP Peak Power	ERP Peak Power (mW)
Low CH - 824.2	GPRS	29.8	955.0
Mid CH - 836.6		29.5	891.3
High CH - 848.8		29.5	891.3

1850 to 1910 MHz Authorized Band

Frequency Range (MHz)	Modulation	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low CH - 1850.20	GPRS	29.3	851.1
Mid CH - 1880.00		30.4	1096.5
High CH - 1909.80		31.5	1412.5

7.2. RADIATED OUTPUT POWER

LIMITS

22.913(a) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232(b) & RSS133 § 6.4 Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

RSS-132 § 4.4 The maximum ERP shall be 6.3 Watts for mobile stations.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.2.17.

RESULTS

CELL OUTPUT POWER (ERP)

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG
Project #: 09I12737
Date: 12/28/2009
Test Engineer: MENGISTU MEKURIA
Configuration: EUT INSTALLED INSIDE SAMSUNG MINI-LAPTOP
Mode: TX CELL BAND GPRS MODE

Test Equipment:
Receiving: Sunol T130, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.20	-2.8	V	32.6	29.8	38.5	-8.7	
824.20	-2.4	H	30.4	28.0	38.5	-10.5	
836.60	-3.2	V	32.7	29.5	38.5	-9.0	
836.60	-1.3	H	30.7	29.4	38.5	-9.0	
848.80	-3.9	V	32.0	28.1	38.5	-10.4	
848.80	-1.3	H	30.8	29.5	38.5	-9.0	

Rev. 1.24.7

PCS OUTPUT POWER (EIRP)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG
Project #: 09I12978
Date: 12/28/2009
Test Engineer: MENGISTU MEKURIA
Configuration: EUT INSTALLED INSIDE SAMSUNG MINI-LAPTOP
Mode: TX PCS BAND GPRS MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T72 Substitution, 6ft SMA Cable (208947003) Warehouse

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.850	-14.5	V	40.2	25.6	33.0	-7.4	
1.850	-10.2	H	39.5	29.3	33.0	-3.7	
1.880	-13.6	V	40.3	26.7	33.0	-6.4	
1.880	-9.8	H	40.1	30.4	33.0	-2.6	
1.910	-12.6	V	40.2	27.6	33.0	-5.4	
1.910	-8.6	H	40.1	31.5	33.0	-1.5	

Rev. 1.24.7

7.3. FIELD STRENGTH OF SPURIOUS RADIATION

LIMIT

§22.917 (e) and §24.238 (a), RSS-132 § 4.5.1, & RSS-133 § 6.5.1 (a) (i) & (b): Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 3.2.12 & FCC 22.917 (b), FCC 24.238 (b), & FCC 27.53 (g)(1)(2)(3).

RESULTS

CELL SPURIOUS & HARMONIC (ERP)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: SAMSUNG
Project #: 09I12978
Date: 12/28/2009
Test Engineer: MENGISTU MEKURIA
Configuration: EUT INSTALLED INSIDE SAMSUNG MINI-LAPTOP
Mode: TX CELL BAND GPRS MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	FCC PART 22

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch. (824.2 MHz)										
1.648	-47.3	H	3.0	37.2	35.5	1.0	-44.6	-13.0	-31.6	
2.473	-43.9	H	3.0	39.8	35.4	1.0	-38.5	-13.0	-25.5	
3.297	-53.5	H	3.0	43.9	35.5	1.0	-44.1	-13.0	-31.1	
4.121	-65.9	H	3.0	46.7	35.2	1.0	-53.5	-13.0	-40.5	
4.945	-66.1	H	3.0	48.8	35.3	1.0	-51.6	-13.0	-38.6	
6.594	-68.9	H	3.0	51.8	35.6	1.0	-51.8	-13.0	-38.8	
1.648	-48.6	V	3.0	36.8	35.5	1.0	-46.4	-13.0	-33.4	
2.473	-41.7	V	3.0	41.7	35.4	1.0	-34.5	-13.0	-21.5	
3.297	-55.8	V	3.0	44.1	35.5	1.0	-46.2	-13.0	-33.2	
4.121	-62.4	V	3.0	46.1	35.2	1.0	-50.5	-13.0	-37.5	
4.945	-64.9	V	3.0	48.2	35.3	1.0	-51.1	-13.0	-38.1	
5.769	-65.3	V	3.0	49.4	35.5	1.0	-50.4	-13.0	-37.4	
6.594	-66.6	V	3.0	50.3	35.6	1.0	-50.9	-13.0	-37.9	
Mid Ch. (836.6 MHz)										
1.673	-44.0	H	3.0	37.5	35.5	1.0	-41.0	-13.0	-28.0	
2.510	-37.1	H	3.0	39.9	35.4	1.0	-31.6	-13.0	-18.6	
3.346	-56.4	H	3.0	44.1	35.5	1.0	-46.8	-13.0	-33.8	
4.183	-65.8	H	3.0	46.8	35.2	1.0	-53.2	-13.0	-40.2	
5.020	-66.5	H	3.0	48.9	35.3	1.0	-51.9	-13.0	-38.9	
6.693	-65.9	H	3.0	52.0	35.7	1.0	-48.6	-13.0	-35.6	
1.673	-45.9	V	3.0	37.1	35.5	1.0	-43.3	-13.0	-30.3	
2.510	-39.1	V	3.0	41.8	35.4	1.0	-31.7	-13.0	-18.7	
3.346	-57.1	V	3.0	44.3	35.5	1.0	-47.4	-13.0	-34.4	
4.183	-63.2	V	3.0	46.3	35.2	1.0	-51.2	-13.0	-38.2	
5.020	-65.6	V	3.0	48.3	35.3	1.0	-51.6	-13.0	-38.6	
5.856	-65.5	V	3.0	49.5	35.5	1.0	-50.5	-13.0	-37.5	
6.693	-60.4	V	3.0	50.5	35.7	1.0	-44.6	-13.0	-31.6	
Hi Ch. (848.8 MHz)										
1.698	-44.4	H	3.0	37.7	35.5	1.0	-41.2	-13.0	-28.2	
2.546	-40.1	H	3.0	40.1	35.4	1.0	-34.4	-13.0	-21.4	
3.395	-55.9	H	3.0	44.3	35.5	1.0	-46.1	-13.0	-33.1	
4.244	-65.2	H	3.0	47.0	35.2	1.0	-52.4	-13.0	-39.4	
5.093	-67.9	H	3.0	49.1	35.3	1.0	-53.1	-13.0	-40.1	
6.790	-63.8	H	3.0	52.1	35.7	1.0	-46.3	-13.0	-33.3	
1.698	-44.9	V	3.0	37.4	35.5	1.0	-41.9	-13.0	-28.9	
2.546	-39.9	V	3.0	42.0	35.4	1.0	-32.3	-13.0	-19.3	
3.395	-57.7	V	3.0	44.4	35.5	1.0	-47.8	-13.0	-34.8	
4.244	-65.2	V	3.0	46.5	35.2	1.0	-53.0	-13.0	-40.0	
5.093	-66.7	V	3.0	48.5	35.3	1.0	-52.5	-13.0	-39.5	
5.942	-66.7	V	3.0	49.6	35.5	1.0	-51.6	-13.0	-38.6	
6.790	-58.0	V	3.0	50.6	35.7	1.0	-42.2	-13.0	-29.2	

Rev. 03.03.09

PCS Spurious & Harmonic (EIRP)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: SAMSUNG
Project #: 09I12978
Date: 12/28/2009
Test Engineer: MENGISTU MEKURIA
Configuration: EUT INSTALLED INSIDE SAMSUNG MINI-LAPTOP
Mode: TX PCS BAND GPRS MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	FCC PART 24

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch. (1850.25 MHz)										
3.701	-44.7	H	3.0	45.3	35.4	1.0	-33.7	-13.0	-20.7	
5.551	-58.0	H	3.0	50.0	35.4	1.0	-42.4	-13.0	-29.4	
7.401	-62.1	H	3.0	53.0	35.7	1.0	-43.9	-13.0	-30.9	
9.251	-59.1	H	3.0	55.1	35.6	1.0	-38.6	-13.0	-25.6	
12.952	-66.3	H	3.0	57.6	34.0	1.0	-41.8	-13.0	-28.8	
3.701	-45.1	V	3.0	45.1	35.4	1.0	-34.3	-13.0	-21.3	
5.551	-55.2	V	3.0	49.2	35.4	1.0	-40.5	-13.0	-27.5	
7.401	-61.5	V	3.0	51.3	35.7	1.0	-44.9	-13.0	-31.9	
9.251	-54.2	V	3.0	53.6	35.6	1.0	-35.2	-13.0	-22.2	
12.952	-63.2	V	3.0	58.0	34.0	1.0	-38.2	-13.0	-25.2	
Mid Ch. (1880.0 MHz)										
3.760	-58.7	H	3.0	45.5	35.3	1.0	-47.5	-13.0	-34.5	
5.640	-64.5	H	3.0	50.2	35.4	1.0	-48.8	-13.0	-35.8	
7.520	-66.5	H	3.0	53.1	35.7	1.0	-48.1	-13.0	-35.1	
9.400	-61.4	H	3.0	55.2	35.6	1.0	-40.7	-13.0	-27.7	
13.160	-69.5	H	3.0	57.9	34.0	1.0	-44.6	-13.0	-31.6	
3.760	-59.9	V	3.0	45.3	35.3	1.0	-49.0	-13.0	-36.0	
5.640	-61.0	V	3.0	49.3	35.4	1.0	-46.1	-13.0	-33.1	
7.520	-64.8	V	3.0	51.4	35.7	1.0	-48.1	-13.0	-35.1	
9.400	-57.0	V	3.0	53.7	35.6	1.0	-37.8	-13.0	-24.8	
13.160	-66.9	V	3.0	58.3	34.0	1.0	-41.6	-13.0	-28.6	
Hi Ch. (1909.75MHz)										
3.820	-56.4	H	3.0	45.7	35.3	1.0	-45.0	-13.0	-32.0	
5.729	-61.1	H	3.0	50.3	35.4	1.0	-45.2	-13.0	-32.2	
7.639	-65.2	H	3.0	53.2	35.7	1.0	-46.6	-13.0	-33.6	
9.549	-62.3	H	3.0	55.4	35.6	1.0	-41.4	-13.0	-28.4	
13.368	-68.1	H	3.0	58.2	33.9	1.0	-42.9	-13.0	-29.9	
3.820	-57.8	V	3.0	45.4	35.3	1.0	-46.7	-13.0	-33.7	
5.729	-57.9	V	3.0	49.4	35.4	1.0	-42.9	-13.0	-29.9	
7.639	-64.7	V	3.0	51.6	35.7	1.0	-47.8	-13.0	-34.8	
9.549	-58.4	V	3.0	53.9	35.6	1.0	-39.1	-13.0	-26.1	
13.368	-66.0	V	3.0	58.5	33.9	1.0	-40.5	-13.0	-27.5	

Rev. 03.03.09